Abstract Submitted
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Poloidal structure of the plasma response to $n = 1$ Resonant Magnetic Perturbations in ASDEX Upgrade L MARRELLI, P BETTINI, P PIOVESAN, D TERRANOVA, Consorzio RFX, Italy, L GIANNONE, V IGOCHINE, M MARASCHEK, W SUTTROP, M TESCHKE, Max-Planck-Institut fur Plasmaphysik, Garching, Germany, Y.Q. LIU, CCFE, Culham Science Centre,UK, D RYAN, Department of Physics, University of York, UK, EUROFUSION MST1 TEAM[1], ASDEX UPGRADE TEAM — The hybrid scenario, a candidate for high-beta steady-state tokamak operations, becomes highly sensitive to 3D magnetic field near the no-wall limit. A predictive understanding of the plasma response to 3D fields near ideal MHD limits in terms of validated MHD stability codes is therefore important in order to safely operate future devices. Slowly rotating ($5-10Hz$) $n = 1$ external magnetic fields have been applied in hybrid discharges in ASDEX Upgrade for an experimental characterization: the global $n = 1$ kink response has been measured by means of SXR and complete poloidal arrays of b_θ probes located at different toroidal angles and compared to predictions of MHD codes such as MARS-F and V3FIT-VMEC. A Least-Squares Spectral Analysis approach has been developed together with a Monte Carlo technique to extract the small plasma response and its confidence interval from the noisy magnetic signals. MARS-F correctly reproduces the poloidal structure of the $n = 1$ measurements: for example, the dependence of the dominant poloidal mode number at the plasma edge from q_{95} is the same as in the experiment. Similar comparisons with V3FIT-VMEC and will be presented.

[1]See author list of H. Meyer et al 2017 Nucl. Fusion 57 102014

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